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EXAMINER

BRANDT, CHRISTOPHER M

ART UNIT

PAPER NUMBER

2617

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/767,082	<b>Applicant(s)</b> YUN ET AL.	
	<b>Examiner</b> CHRISTOPHER M. BRANDT	<b>Art Unit</b> 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4,6,7,10-12,15-20 and 23-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,6,7,10-12,15-20 and 23-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

This Action is in response to applicant's amendment / arguments filed on March 9, 2009.

**Claims 1-4, 6, 7, 10-12, 15-20, and 23-38** are still currently pending in the present application.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-4, 6, 7, 10-12, 15-20, and 23-38 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims 1-4, 6, 7, 10, 11, 17-20, 23-26, 28-30, 31-34, 35-36** are rejected under 35 USC 102(b) as being unpatentable over **Johnson et al. (WO 00/05912, hereinafter Johnson)** in view of **Schafer (US PGPUB 2003/0026215 A1)** in view of **Uebayashi et al. (US PGPUB 2001/0055288 A1, hereinafter Uebayashi)** and further in view of **Barnard et al. (US PGPUB 20020024937 A1, hereinafter Barnard)**.

Consider **claim 1 (and similarly applied to claims 24 and 25)**. Johnson discloses a wireless communication system for providing a service in a time division duplexing (TDD) mode and a frequency division duplexing (FDD) mode (abstract, page 1 lines 34-36), the system comprising:

a mobile station for, during call setup, transmitting a duplexing mode determination factor to a base station, setting a TDD mode or an FDD mode as a reverse mode set by the base station, and setting up a channel for the set reverse mode and a forward channel to perform communication (figures 1 and 8, page 9 line 36 – page 10 line 7, read as a cellular phone determines the communication characteristics that it requires and based on those characteristics the base station sets a TDD or an FDD mode for communications); and

a base station for, during call setup, receiving the duplexing mode determination factor from the mobile station, setting a reverse mode to the TDD mode or the FDD mode using the received duplexing mode determination factor, and setting up a reverse channel for the set mode and a TDD mode for forward transmission to communication with the mobile station (figures 1

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and 8, page 9 line 36 – page 10 line 7, lines 9-16, page 10 line 33 – page 11 line 7, read as a cellular phone determines the communication characteristics that it requires and based on those characteristics the base station sets a TDD or an FDD mode for communications, where the base station receives the request for service from the cellular phone).

Johnson substantially discloses the claimed invention but fails to explicitly teach wherein the base station sets up a guard time of a predetermined time between switching times of a forward link and a reverse link in the TDD mode, and assigns time slots beginning at a time slot in an area close to the guard time in order of each mobile station nearest to the base station.

However, Schafer teaches wherein the base station sets up a guard time of a predetermined time between switching times of a forward link and a reverse link in the TDD mode, and assigns time slots beginning at a time slot in an area close to the guard time in order of each mobile station nearest to the base station (figures 3a, 3b, paragraphs 21 and 43, read as a TDD frame consisting of a forward link or transmit frame and a reverse link or receive frame having guard times GT1 and GT2. In addition, Schafer discloses that this is based on the subscriber system disposed closest to the hub).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Schafer into the invention of Johnson in order to provide separation from a next frame or frame portion (paragraph 43).

In addition, Johnson and Schafer fail to explicitly teach wherein the base station assigns a frequency resource in a predetermined area among frequency resources available in the base station as reverse link resource for reverse transmission, and switches available frequency resources to a forward link and a reverse link in the TDD mode.

However, Uebayashi teaches wherein the base station assigns a frequency resource in a predetermined area among frequency resources available in the base station as reverse link resource for reverse transmission, and switches available frequency resources to a forward link and a reverse link in the TDD mode (paragraph 193, read as a service area based on the CDMA-FDD method by switching its assigned channel from one based on the CDMA-FDD method to the one based on the CDMA-TDD method may have its assigned channel switched to the one based on the CDMA-FDD method to one based on the CDMA-TDD method, where there can also be an imbalance between the reverse link and forward link in the CDMA-FDD (i.e. no forward link assignments).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Uebayashi into the invention of Johnson and Schafer in order to execute appropriate channel assignment in a mobile communication system when both a channel for a service area based on a FDD method and a channel for a service area based on a TDD method can be assigned (paragraph 138).

Moreover, Johnson, Schafer, and Uebayashi fail to explicitly teach the assignment of a frequency resource as a reverse link resource in the FDD mode for reverse link transmission, and the assignment of the remaining frequency resources to a forward link and a reverse link in the TDD mode (Uebayashi teaches the switching of resources from FDD mode to TDD mode and visa-versa).

However, Barnard teaches the assignment of a frequency resource as a reverse link resource in the FDD mode for reverse link transmission, and the assignment of the remaining frequency resources to a forward link and a reverse link in the TDD mode (paragraph 70, read as

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it may be effective to consider the use of FDD bands for uplink only, with TDD supporting the mix of uplink and down-link).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Barnard into the invention of Johnson, Schafer, and Uebayashi in order to handle the required asymmetric traffic without consuming excessive system resources (paragraph 70).

Consider **claim 17**. Johnson discloses a call control method in a mobile station for a mobile communication system providing a time division duplexing (TDD) mode and a frequency division duplexing (FDD) mode (abstract, page 1 lines 34-36), the method comprising the steps of:

generating a duplexing mode determination factor and reporting the generated duplexing mode determination factor to a base station when assignment of a call is necessary communication (figures 1 and 8, page 9 line 36 – page 10 line 7, read as a cellular phone determines the communication characteristics that it requires and based on those characteristics the base station sets a TDD or an FDD mode for communications);

setting transmission and reception modes based on the received mode upon receiving a mode for a reverse link from the base station (station (figures 1 and 8, page 9 line 36 – page 10 line 7, lines 9-16, page 10 line 33 – page 11 line 7, read as a cellular phone determines the communication characteristics that it requires and based on those characteristics the base station sets a TDD or an FDD mode for communications, where the base station receives the request for service from the cellular phone);

sending a channel assignment request to the base station to perform communication with a channel assigned during channel assignment (figures 1 and 8, page 9 lines 26-34, page 9 line 36 – page 10 line 7, page 11 line 35 – page 12 line 3, read as the base station receives the request for service based on the cellular phone's determination of the characteristics and then the base station sets a TDD or an FDD mode for communications).

Johnson substantially discloses the claimed invention but fails to explicitly teach wherein the base station sets up a guard time of a predetermined time between switching times of a forward link and a reverse link in the TDD mode, and assigns time slots beginning at a time slot in an area close to the guard time in order of each mobile station nearest to the base station.

However, Schafer teaches wherein the base station sets up a guard time of a predetermined time between switching times of a forward link and a reverse link in the TDD mode, and assigns time slots beginning at a time slot in an area close to the guard time in order of each mobile station nearest to the base station (figures 3a, 3b, paragraphs 21 and 43, read as a TDD frame consisting of a forward link or transmit frame and a reverse link or receive frame having guard times GT1 and GT2. In addition, Schafer discloses that this is based on the subscriber system disposed closest to the hub).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Schafer into the invention of Johnson in order to provide separation from a next frame or frame portion (paragraph 43).

In addition, Johnson and Schafer fail to explicitly teach wherein the base station assigns a frequency resource in a predetermined area among frequency resources available in the base

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station as reverse link resource for reverse transmission, and switches available frequency resources to a forward link and a reverse link in the TDD mode.

However, Uebayashi teaches wherein the base station assigns a frequency resource in a predetermined area among frequency resources available in the base station as reverse link resource for reverse transmission, and switches available frequency resources to a forward link and a reverse link in the TDD mode (paragraph 193, read as a service area based on the CDMA-FDD method by switching its assigned channel from one based on the CDMA-FDD method to the one based on the CDMA-TDD method may have its assigned channel switched to the one based on the CDMA-FDD method to one based on the CDMA-TDD method, where there can also be an imbalance between the reverse link and forward link in the CDMA-FDD (i.e. no forward link assignments).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Uebayashi into the invention of Johnson and Schafer in order to execute appropriate channel assignment in a mobile communication system when both a channel for a service area based on a FDD method and a channel for a service area based on a TDD method can be assigned (paragraph 138).

Moreover, Johnson, Schafer, and Uebayashi fail to explicitly teach the assignment of a frequency resource as a reverse link resource in the FDD mode for reverse link transmission, and the assignment of the remaining frequency resources to a forward link and a reverse link in the TDD mode (Uebayashi teaches the switching of resources from FDD mode to TDD mode and visa-versa).

However, Barnard teaches the assignment of a frequency resource as a reverse link resource in the FDD mode for reverse link transmission, and the assignment of the remaining frequency resources to a forward link and a reverse link in the TDD mode (paragraph 70, read as it may be effective to consider the use of FDD bands for uplink only, with TDD supporting the mix of uplink and down-link).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Barnard into the invention of Johnson, Schafer, and Uebayashi in order to handle the required asymmetric traffic without consuming excessive system resources (paragraph 70).

Consider **claim 2 and as applied to claim 1**. Johnson discloses wherein the mobile station generates the duplexing mode determination factor and reports the generated duplexing mode determination factor to the base station during predetermined periods in an active state (figures 1 and 8, page 9 line 36 –age 10 line 7, page 13 lines 5-10).

Consider **claim 3 and as applied to claim 1**. Johnson discloses wherein the base station determines whether switching of a reverse mode of the mobile station is required each time a duplexing mode determination factor is received from the mobile station in the active state, and controls switching of the set mode and assigns a new channel to the mobile station to perform communication when mode switching is required (figure 8 page 9 lines 26-34, page 9 line 36 – page 10 line 15).

Consider **claims 4 and 20 and as applied to claims 1 and 17, respectively**. Johnson discloses wherein the duplexing mode determination factor includes at least one of power of a

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pilot signal received from the base station and geographical position information of the mobile station ((figure 8 page 9 lines 26-34, page 9 line 36 – page 10 line 15).

Consider **claim 6, 7, and 19 and as applied to claims 4, 5, and 18, respectively.**

**Johnson discloses** wherein the duplexing mode determination factor is transmitted over a dedicated control channel for the set mode (figures 8, page 9 lines 26-34, page 9 line 36 – page 10 line 15).

Consider **claim 10 and as applied to claim 1.** Johnson discloses wherein channels for the forward link are assigned time slots beginning at a time slot in an area close to the guard time in order of mobile station nearest to the base station according to a position of the mobile station, detected from the duplexing mode determination factor (figures 1 and 8, page 9 line 36 – page 10 line 7, lines 9-16, page 10 line 33 – page 11 line 7).

Consider **claim 11 and as applied to claim 1.** Johnson discloses wherein channels for the reverse link for the TDD mode are assigned time slots beginning at a time slot in an area close to the guard time in order of mobile station nearest to the base station according to a position of the mobile station, detected from the duplexing mode determination factor (figures 6 and 7, page 9 line 36 – page 10 line 7, lines 9-16, page 10 line 33 – page 11 line 7).

Consider **claim 18 and as applied to claim 17.** Johnson discloses generating information obtained using the duplexing mode determination factor and reporting the generated information to the base station during predetermined periods during communication; and performing mode switching and performing communication with the new channel if a reverse

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mode switching request is received from the base station and a new channel is assigned by the base station (figure 8, page 9 lines 26-34, page 9 lines 36 – page 10 line 15).

Consider **claim 23 and as applied to claim 18**. Johnson discloses wherein the information obtained using the duplexing mode determination factor comprises power of a pilot signal received from the base station and geographical position information of the mobile station (page 9 lines 26-34, page 9 line 36 – page 10 line 15).

Consider **claim 26 (and similarly applied to claim 35)**. Johnson discloses a method for allocating resources in a wireless communication system, the wireless communications system including a plurality of mobile stations, and a base station for allocating and communicating with the mobile stations, the method (abstract, page 1 lines 34-36) comprising the steps of:

dividing, by the base station, a system bandwidth into a different time division duplexing (TDD) bandwidth and a different frequency division duplexing (FDD) bandwidth (page 9 lines 2-5, read as the range of bandwidths can be subdivided into more than three portions, the portions being allocated for FDD uplink/downlink transmissions and TDD communications);

receiving a mode determination factor from the mobile station (figures 1 and 8, page 9 line 36 – page 10 line 7 lines 9-16, page 10 line 33 – page 11 line 7, read as the base station receives the request for service based on characteristics determined by the mobile station); and

allocating at least one of TDD bandwidth and FDD bandwidth according to the mode determination factor (page 10 lines 18 – 31, read as the base station receives the request and assigns the TDD or FDD scheme).

Johnson substantially discloses the claimed invention but fails to explicitly teach wherein the base station sets up a guard time of a predetermined time between switching times of a forward link and a reverse link in the TDD mode, and assigns time slots beginning at a time slot in an area close to the guard time in order of each mobile station nearest to the base station.

However, Schafer teaches wherein the base station sets up a guard time of a predetermined time between switching times of a forward link and a reverse link in the TDD mode, and assigns time slots beginning at a time slot in an area close to the guard time in order of each mobile station nearest to the base station (figures 3a, 3b, paragraphs 21 and 43, read as a TDD frame consisting of a forward link or transmit frame and a reverse link or receive frame having guard times GT1 and GT2. In addition, Schafer discloses that this is based on the subscriber system disposed closest to the hub).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Schafer into the invention of Johnson in order to provide separation from a next frame or frame portion (paragraph 43).

In addition, Johnson and Schafer fail to explicitly teach wherein the base station assigns a frequency resource in a predetermined area among frequency resources available in the base station as reverse link resource for reverse transmission, and switches available frequency resources to a forward link and a reverse link in the TDD mode.

However, Uebayashi teaches wherein the base station assigns a frequency resource in a predetermined area among frequency resources available in the base station as reverse link resource for reverse transmission, and switches available frequency resources to a forward link and a reverse link in the TDD mode (paragraph 193, read as a service area based on the CDMA-

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FDD method by switching its assigned channel from one based on the CDMA-FDD method to the one based on the CDMA-TDD method may have its assigned channel switched to the one based on the CDMA-FDD method to one based on the CDMA-TDD method, where there can also be an imbalance between the reverse link and forward link in the CDMA-FDD (i.e. no forward link assignments).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Uebayashi into the invention of Johnson and Schafer in order to execute appropriate channel assignment in a mobile communication system when both a channel for a service area based on a FDD method and a channel for a service area based on a TDD method can be assigned (paragraph 138).

Moreover, Johnson, Schafer, and Uebayashi fail to explicitly teach the assignment of a frequency resource as a reverse link resource in the FDD mode for reverse link transmission, and the assignment of the remaining frequency resources to a forward link and a reverse link in the TDD mode (Uebayashi teaches the switching of resources from FDD mode to TDD mode and visa-versa).

However, Barnard teaches the assignment of a frequency resource as a reverse link resource in the FDD mode for reverse link transmission, and the assignment of the remaining frequency resources to a forward link and a reverse link in the TDD mode (paragraph 70, read as it may be effective to consider the use of FDD bands for uplink only, with TDD supporting the mix of uplink and down-link).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Barnard into the invention of Johnson,

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Schafer, and Uebayashi in order to handle the required asymmetric traffic without consuming excessive system resources (paragraph 70).

Consider **claim 28 and as applied to claim 26**. Johnson discloses wherein the TDD bandwidth includes at least one of downlink and uplink resources (page 9 lines 2-5).

Consider **claim 29 and as applied to claim 28**. Johnson discloses wherein the FDD bandwidth includes uplink resources (page 9 lines 2-5).

Consider **claim 30 and as applied to claim 29**. Johnson discloses wherein the allocating step comprises: comparing the mode determination factor with a predetermined threshold; allocating uplink and downlink resources of the TDD bandwidth if the mode determination factor is less than the predetermined threshold; and allocating uplink resources of FDD bandwidth if the mode determination factor is greater than or equal to the predetermined threshold (page 10 line 33 – page 11 line 7).

Consider **claim 31 and as applied to claim 30**. Johnson, Schafer, and Uebayashi disclose wherein the mode determination factor is a pilot signal strength, which at least one mobile station (MS) receives from the base station (Uebayashi; paragraph 178, read as the switching operation may be performed on the basis of reception power of a forward common channel by a mobile station).

Consider **claim 32 and as applied to claim 30**. Johnson discloses wherein the mode determination factor is geographical position information of the mobile station (page 10 lines 9-12).

Consider **claim 33 and as applied to claim 30** Johnson discloses wherein the mode determination factor is moving velocity of a mobile station (page 10 lines 9-12).

Consider **claim 34 and as applied to claim 30**. Johnson, Schafer, and Uebayashi disclose wherein the mode determination factor is determined at least to be one of a pilot signal strength, which at least one MS receives from the base station, and the moving velocity of the mobile station (Uebayashi; paragraph 178, read as the switching operation may be performed on the basis of reception power of a forward common channel by a mobile station).

Consider **claim 36 and as applied to claim 35**. Johnson discloses the apparatus wherein the encoding processor comprises: an FDD decoder for processing the received FDD signal and sending the processed FDD signal to the transmission/reception separator; a TDD decoder for processing the received TDD signal and sending the processed TDD signal to the transmission/reception separator; and a TDD encoder for processing the TDD bandwidth signal, and transmitting the processed signal to the transmitting and received separator (figures 1 and 8, page 9 lines 2-5, page 9 line 36 – page 10 line 7 lines 9-16, page 10 line 33 – page 11 line 7).

**Claims 12, 15, 16, 37, and 38** are rejected under 35 USC 102(b) as being unpatentable over **Johnson et al. (WO 00/05912, hereinafter Johnson)** in view of **Schafer (US PG PUB 2003/0026215 A1)** in view of **Akerberg (US PG PUB 2004/0157561 A1)** in view of **Barnard et al. (US PG PUB 20020024937 A1, hereinafter Barnard)** and further in view of **Uebayashi et al. (US PG PUB 2001/0055288 A1, hereinafter Uebayashi)**.

Consider **claim 12 (and similarly applied to claim 37)**. Johnson discloses a call control method in a base station for a wireless communication system, the base station being capable of communicating with a mobile station in a time division duplexing (TDD) mode and a frequency division duplexing (FDD) mode (abstract, page 1 lines 34-46), the method comprising the steps of:

during call assignment to the mobile station, analyzing a duplexing mode determination factor received from the mobile station to determine whether the mobile station is located in a close area with respect to the base station (figures 1 and 8, page 9 lines 26-34, page 9 line 36 – page 10 line 7, page 11 line 35 – page 12 line 3, read as during a call assignment to the base station determines position of mobile station from communication with the cellular phone); and

assigning a TDD channel to a forward link and a reverse link if the mobile station is located in the close area, and assigning a TDD channel to the forward link and an FDD channel to the reverse link to perform communication if the mobile station is located in a remote area with respect to the base station (figures 1 and 8, page 9 lines 26-34, page 9 line 36 – page 10 line 7, page 11 lines 35 – page 12 line 3, read as the most appropriate duplexing scheme and the most appropriate macro or micro cell).

Johnson substantially discloses the claimed invention but fails to explicitly teach wherein the base station sets up a guard time of a predetermined time between switching times of a forward link and a reverse link in the TDD mode, and assigns time slots beginning at a time slot in an area close to the guard time in order of each mobile station nearest to the base station.

However, Schafer teaches wherein the base station sets up a guard time of a predetermined time between switching times of a forward link and a reverse link in the TDD mode, and assigns time slots beginning at a time slot in an area close to the guard time in order of each mobile station nearest to the base station (figures 3a, 3b, paragraphs 21 and 43, read as a TDD frame consisting of a forward link or transmit frame and a reverse link or receive frame having guard times GT1 and GT2. In addition, Schafer discloses that this is based on the subscriber system disposed closest to the hub).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Schafer into the invention of Johnson in order to provide separation from a next frame or frame portion (paragraph 43).

In addition, Johnson and Schafer fail to explicitly teach assigning to the mobile station a channel of a forward link or a reverse link in the TDD mode if the mobile station is locating in the close area, and a channel of the forward link in the TDD mode or a channel of the reverse link in the FDD mode if the mobile station is located in a remote area.

However, Akerberg teaches assigning to the mobile station a channel of a forward link or a reverse link in the TDD mode if the mobile station is locating in the close area, and a channel of the forward link in the TDD mode or a channel of the reverse link in the FDD mode if the mobile station is located in a remote area (paragraph 76, read as assigning FDD mode for the macro system and the TDD mode in the micro system since applicant's specification states that the close area is the micro area and the remote area is the macro area).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Akerberg into the invention of Johnson and Schafer in order to reduce interference between mobile stations and/or base stations (abstract).

Moreover, Johnson, Schafer, and Akerberg fail to explicitly teach wherein the base station assigns a frequency resource in a predetermined area among frequency resources available in the base station as reverse link resource for reverse transmission, and switches available frequency resources to a forward link and a reverse link in the TDD mode.

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However, Uebayashi teaches wherein the base station assigns a frequency resource in a predetermined area among frequency resources available in the base station as reverse link resource for reverse transmission, and switches available frequency resources to a forward link and a reverse link in the TDD mode (paragraph 193, read as a service area based on the CDMA-FDD method by switching its assigned channel from one based on the CDMA-FDD method to the one based on the CDMA-TDD method may have its assigned channel switched to the one based on the CDMA-FDD method to one based on the CDMA-TDD method, where there can also be an imbalance between the reverse link and forward link in the CDMA-FDD (i.e. no forward link assignments).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Uebayashi into the invention of Johnson, Schafer, and Akerberg in order to execute appropriate channel assignment in a mobile communication system when both a channel for a service area based on a FDD method and a channel for a service area based on a TDD method can be assigned (paragraph 138).

Lastly, Johnson, Schafer, Akerberg, and Uebayashi fail to explicitly teach the assignment of a frequency resource as a reverse link resource in the FDD mode for reverse link transmission, and the assignment of the remaining frequency resources to a forward link and a reverse link in the TDD mode (Uebayashi teaches the switching of resources from FDD mode to TDD mode and visa-versa).

However, Barnard teaches the assignment of a frequency resource as a reverse link resource in the FDD mode for reverse link transmission, and the assignment of the remaining frequency resources to a forward link and a reverse link in the TDD mode (paragraph 70, read as

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it may be effective to consider the use of FDD bands for uplink only, with TDD supporting the mix of uplink and down-link).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Barnard into the invention of Johnson, Schafer, Akerberg, and Uebayashi in order to handle the required asymmetric traffic without consuming excessive system resources (paragraph 70).

Consider **claim 15 and as applied to claim 12**. Johnson discloses wherein channels for the forward link are assigned time slots beginning at a time slot in an area close to the guard time in order of mobile station nearest to the base station according to a position of the mobile station, detected from the duplexing mode determination factor (figures 1 and 8, page 9 line 36 – page 10 line 7, lines 9-16, page 10 line 33 – page 11 line 7).

Consider **claim 16 and as applied to claim 12**. Johnson discloses checking again a position of the mobile station to determine whether the mobile station is located in the close area or the remote area upon receiving a duplexing mode determination factor from the mobile station during communication with the mobile station; and determining whether mode switching is required according to the checked position of the mobile station, and assigning a mode switching message and a new channel to perform communication if mode switching is necessary (page 13 lines 5-10).

Consider **claim 38 and as applied to claim 37**. Johnson, Schafer, and Akerberg teach wherein the base station sets up a guard time of a predetermined time between switching times of a forward link and a reverse link in the TDD mode, and assigns time slots beginning at a time slot in an area close to the guard time in order of each mobile station nearest to the base station

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(Schafer; figures 3a, 3b, paragraphs 21 and 43, read as a TDD frame consisting of a forward link or transmit frame and a reverse link or receive frame having guard times GT1 and GT2. In addition, Schafer discloses that this is based on the subscriber system disposed closest to the hub)

**Claim 27** is rejected under 35 USC 103(a) as being unpatentable over **Johnson et al. (WO 00/05912)** in view of **Schafer (US PG PUB 2003/0026215 A1)** in view of **Uebayashi et al. (US PG PUB 2001/0055288 A1, hereinafter Uebayashi)** in view of **Barnard et al. (US PG PUB 20020024937 A1, hereinafter Barnard)** and further in view of **Samuels et al. (US PG PUB 2003/0003882 A1, hereinafter Samuels)**.

Consider **claim 27 and as applied to claim 26**. Johnson, Schafer, Uebayashi, and Barnard disclose the claimed invention but fail to teach wherein the TDD bandwidth is greater than the FDD bandwidth (page 9 lines 7-20).

However, Samuels discloses wherein the TDD bandwidth is greater than the FDD bandwidth (paragraph 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Samuels into the invention of Johnson, Schafer, Uebayashi, and Barnard in order to have more timeslots allocated to the downlink, as a user is receiving more data than he is sending (paragraph 2).

### **Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any response to this Office Action should be **faxed to (571) 273-8300 or mailed to:**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**Hand-delivered responses** should be brought to

Customer Service Window  
Randolph Building  
401 Dulany Street  
  
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Brandt whose telephone number is (571) 270-1098. The examiner can normally be reached on 7:30a.m. to 5p.m..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Eng can be reached on (571) 272-7495. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

Christopher M. Brandt

C.M.B./cmb

May 11, 2009

/George Eng/

Supervisory Patent Examiner, Art Unit 2617